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CLAIMS

[Claim(s)]
[Claim 1] A load detection means to detect each load applied before and after a sheet including the load concerning a seat back, An amendment means to amend each load before and after computing the load center of gravity of a sheet based on each load before and after detecting with this load detection means and detecting with said load detection means based on the calculation value, Crew weight detection equipment characterized by having a crew weight presumption means to presume crew weight based on the amendment load amended with this amendment means.
[Claim 2] The front lever rocked according to the load applied to the anterior part of a sheet including the load concerning a seat back, The back lever rocked according to the load applied to the posterior part of a sheet including the load concerning a seat back, A load detection means to detect the sum of the load doubled by said front lever by the predetermined rate of redoubling, and the load doubled by said back lever by the predetermined rate of redoubling, the rate of load redoubling according the rate of load redoubling by the preparation and said front lever to said back lever -- comparing -- the rate of predetermined -- the crew weight detection equipment characterized by setting up greatly.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the crew weight detection equipment which is applied to crew weight detection equipment, especially is arranged by the sheet of an automobile.
[0002]
[Description of the Prior Art] Conventionally, the structure shown in JP,7-186880,A is known as an example of the crew weight detection equipment arranged by the sheet of an automobile.
[0003] As shown in drawing 10 , with this equipment, the weight sensor 102 is arranged in seat cushion 100A of a sheet 100, and the inclination sensor 104 which detects the tilt angle of seat-back 100B is arranged in the connection section of seat cushion 100A and seat-back 100B. Although the detection value by the weight sensor 102 differs from the actual weight of the crew who sat down on the sheet 100, a control unit 106 detects the description which affects the difference of the detection value by the weight sensor 102, and actual crew's weight from the detecting signal from the inclination sensor 104, and it asks for crew's actual weight from the function based on this detected description, and the function of detection weight.
[0004]
[Problem(s) to be Solved by the Invention] However, with this equipment, since the inclination sensor 104 other than the weight sensor 102 was needed in order to detect crew's actual weight, there was fault that components cost increased. In order to improve this, it is possible with the whole sheet, i.e., the both sides of a seat cushion and a seat back, to perform weight detection, but since the recess loads from crew's guide peg to a floor differ greatly depending on crew's taking-a-seat posture, even if the whole sheet performs weight detection, the precision of a detection load gets worse and the fault that dispersion in presumed weight becomes large as the result cannot be solved.
[0005] It is the purpose to obtain the crew weight detection equipment which this invention can reduce components cost in consideration of the above-mentioned fact, and can presume crew's weight with a sufficient precision.
[0006]
[Means for Solving the Problem] A load detection means to detect each load applied before and after a sheet including the load which this invention according to claim 1 requires for a seat back, An amendment means to amend each load before and after computing the load center of gravity of a sheet based on each load before and after detecting with this load detection means and detecting with said load detection means based on the calculation value, It is characterized by having a crew weight presumption means to presume crew weight based on the amendment load amended with this amendment means.
[0007] Therefore, when crew sits down on a sheet, each load applied before and after a sheet including the load concerning a seat back is detected with a load detection means. Based on the amendment load which computed the load center of gravity of a sheet, amended each load of order with the amendment means based on that calculation value based on each load before and behind this, and was amended with the amendment means, crew weight is presumed with a crew weight presumption means. For this

reason, the error of the presumed weight by change of a taking-a-seat posture can be made small, and crew's weight can be presumed with a sufficient precision.
[0008] The front lever rocked according to the load applied to the anterior part of a sheet including the load which this invention according to claim 2 requires for a seat back, The back lever rocked according to the load applied to the posterior part of a sheet including the load concerning a seat back, A load detection means to detect the sum of the load doubled by said front lever by the predetermined rate of redoubling, and the load doubled by said back lever by the predetermined rate of redoubling, the rate of load redoubling according the rate of load redoubling by the preparation and said front lever to said back lever -- comparing -- the rate of predetermined -- it is characterized by setting up greatly.
[0009] Therefore, although a large load escapes from crew's guide peg on a floor when the crew who sat down on the sheet does an anteversion posture, at this time, the augend of the load concerning the anterior part of a sheet becomes large compared with the decrement of the load concerning the posterior part of a sheet. For this reason, the rate of load redoubling of the front lever greatly set up compared with the rate of load redoubling by the back lever doubles at the big rate of redoubling, and the load concerning the anterior part of a sheet is transmitted to a load detection means with it. Consequently, the large load which escaped from crew's guide peg on the floor can be amended. When the crew who sat down on the sheet does a backward-tilting posture, while the load which escapes from crew's guide peg on a floor becomes small on the other hand, the decrement of the load concerning the anterior part of a sheet becomes small compared with the augend of the load concerning the posterior part of a sheet. For this reason, the load doubled by the front lever also becomes small and the small load which escaped from crew's guide peg on the floor can be amended.
[0010]
[Embodiment of the Invention] The 1st operation gestalt of the crew weight detection equipment of this invention is explained according to drawing 1 - drawing 3 .
[0011] In addition, the drawing Nakaya mark FR shows the direction of the car front, and an arrow head UP shows the direction of the car upper part. As shown in drawing 1 , the sheet 12 is attached in the floor 10 of a car, and the sheet 12 equips it with the seat cushion 16 with which crew 14 sits down, and the seat back 18 supporting crew's 14 regions of back.
[0012] As shown in drawing 2 , between the floors 10 of a car near the front end section of the seat cushion frames 20 and 22 of right and left of a sheet 12, the front side load sensors 24 and 26 as a load detection means to detect a sheet load from the load (arrow head F1 of drawing 1) applied to the anterior part of a sheet 12 including the load applied to a seat back 18, respectively are arranged. Moreover, between the floors 10 of a car near the back end section of the seat cushion frames 20 and 22 of right and left of a sheet 12, the back side load sensors 28 and 30 as a load detection means to detect a sheet load from the load (arrow head F2 of drawing 1) applied to the posterior part of a sheet 12 including the load applied to a seat back 18, respectively are arranged.
[0013] As shown in drawing 1 , these front side load sensors 24 and 26 and the back side load sensors 28 and 30 It connects with the load presumption circuit 32 as the amendment means constituted including the microcomputer, and a crew weight presumption means. While this load presumption circuit 32 computes the load center of gravity of a sheet 12 based on each loads F1 and F2 before and after detecting by the load sensors 24, 26, 28, and 30 and amending each loads F1 and F2 based on that calculation value Crew weight is presumed based on the amended amendment load. Moreover, the acceleration sensor 34 which detects the acceleration which acts on the cross direction of a car is connected to the load presumption circuit 32, and even if based on the acceleration G detected by the acceleration sensor 34, it amends.
[0014] Next, an operation of a **** 1 operation gestalt is explained. With the crew weight detection equipment of a **** 1 operation gestalt, in case crew's 14 weight is presumed, acceleration G is read into the load presumption circuit 32 from an acceleration sensor 34. Moreover, while reading each load into the load presumption circuit 32 from the front side load sensors 24 and 26 and computing the before side load F1 as these averages, each load is read into the load presumption circuit 32 from the back side load sensors 28 and 30, and the backside load F2 is computed as these averages.

[0015] Next, while it computes load center-of-gravity location GX=F1/(F1+F2) of a cross direction from the side load F1 and the backside load F2 before computing the load presumption circuit 32 By change of this load center-of-gravity location GX and acceleration G, the before side load F1 and the backside load F2 are amended, sheet load F=A(F1+F2)+BGX+CG is computed, and presumed weight W1=[of crew] f (F) is computed from this sheet load F.
[0016] In addition, A, B, and C are constants, respectively and are memorized by the map of the load presumption circuit 32.
[0017] That is, when the before side load F1 and the backside load F2 are equal, it is set to load center-of-gravity location GX=1/2, and the center between the front side load sensors 24 and 26 and the back side load sensors 28 and 30 serves as a load center-of-gravity location. On the other hand, by crew's 14 anteversion posture etc., in being large compared with the backside load F2, in order that a load center-of-gravity location may move [the before side load F1] to front side load sensor 24 and 26 side, the load center-of-gravity location GX is set to GX>1/2. Consequently, in sheet load F=A(F1+F2) +BGX+CG, the large load which escapes from crew's 14 guide-peg 14A to a floor 10 can be amended, and presumed weight W1=[of crew] f (F) can be computed with a sufficient precision.
[0018] Moreover, by the reliance posture (backward-tilting posture) to crew's 14 seat back 18 etc., in being small compared with the backside load F2, in order that a load center-of-gravity location may move [the before side load F1] to back side load sensor 28 and 30 side, the load center-of-gravity location GX is set to GX<1/2. Consequently, in sheet load F=A(F1+F2)+BGX+CG, the small load which escapes from crew's 14 guide-peg 14A to a floor 10 can be amended, and presumed weight W1= [of crew] f (F) can be computed with a sufficient precision.
[0019] Moreover, when acceleration G has occurred to the front, the recess load from crew's 14 guide-peg 14A to a floor 10 becomes small, and when Deceleration G has occurred to the front, the recess load from crew's 14 guide-peg 14A to a floor 10 becomes large.
[0020] Therefore, as shown in drawing 3 , with the **** 1 operation gestalt, the amendment alpha 1 of the load center-of-gravity location accompanying posture change of crew 14 and amendment alpha 2 by change of acceleration G are carried out to the measured sheet loads F1 and F2. For this reason, the error N of crew's actual weight W and the presumed weight W1 can be made small, and crew's weight can be presumed with a sufficient precision. Moreover, components cost can be reduced for the configuration which does not need an inclination sensor like the conventional technique.
[0021] Next, the 2nd operation gestalt of the crew weight detection equipment of this invention is explained according to drawing 4 - drawing 6 .
[0022] As shown in drawing 4 , the sheet 12 is attached in the floor 10 of a car, and the sheet 12 equips it with the seat cushion 16 with which crew sits down, and the seat back 18 supporting crew's regions of back.
[0023] The sheet slide rail 40 of a right-and-left pair is arranged along with the car cross direction at the sheet 12, and the sheet slide lower rail 42 order both ends of each sheet slide rail 40 are being fixed to the floor 10 by holddown members, such as a bolt, respectively. The sheet slide upper rail 44 is set to these sheet slide lower rails 42 possible [a slide] to the car cross direction, respectively, and the seat cushion frames 20 and 22 of a sheet 12 are connected with the sheet slide upper rail 44. Therefore, the sheet 18 is movable to the car cross direction in one with the sheet slide upper rail 44 to the sheet slide lower rail 42.
[0024] The shaft 46 is constructed over wall section 44A set up near the front end section of the sheet slide upper rail 44 on either side. Bearing 47A formed in before [the front lever 47] side right-and-left both ends is supported to revolve pivotable by this shaft 46, respectively, and the front lever 47 is pivotable to the center of rotation in a shaft 46 to the clock hand of cut (the direction of arrow-head A of drawing 5) of drawing 5 , and the direction of a counter clockwise of drawing 5 (the direction of arrow-head B of drawing 5). Moreover, the front end section of bearing 47A of the front lever 47 is supported to revolve pivotable with the shaft 48 by the wall sections 20A and 22A formed in the front end lower part of the seat cushion frames 20 and 22. Therefore, if the anterior part of the seat cushion frames 20 and 22 is pressed below from the femoral region of the crew who sat down to the seat cushion 16 by the

load which acts on the anterior part of a seat cushion 16, the front lever 47 will rotate in the direction of a counter clockwise of drawing 5 (the direction of arrow-head B of drawing 5).
[0025] The front lever 47 is made into the shape of Y character which the front side opened by plane view, and back end section 47B has reached the abbreviation central lower part of a seat cushion 16. The load sensor 52 as a load detection means is arranged above back end section 47B of the front lever 47. This load sensor 52 is being fixed to the central subordinate side of a bracket 53, and right-and-left both-ends 53A of a bracket 53 is being fixed to the sheet slide upper rail 44 on either side, respectively.
[0026] On the other hand, the shaft 54 is constructed over wall section 44B set up near the back end section of the sheet slide upper rail 44. Bearing 55A formed in backside [the back lever 55] right-and-left both ends is supported to revolve pivotable by this shaft 54, respectively, and the back lever 55 is pivotable to the center of rotation in a shaft 54 to the clock hand of cut (the direction of arrow-head C of drawing 5) of drawing 5 , and the direction of a counter clockwise of drawing 5 (the direction of arrow-head D of drawing 5). Moreover, the back end section of bearing 55A of the back lever 55 is supported to revolve pivotable with the shaft 56 by the wall sections 20B and 22B formed in the back end lower part of the seat cushion frames 20 and 22. Therefore, if the posterior part of the seat cushion frames 20 and 22 is pressed below from the hip of the crew who sat down to the seat cushion 16 by the load which acts on the posterior part of a seat cushion 16, the back lever 55 will rotate to the clock hand of cut (the direction of arrow-head C of drawing 5) of drawing 5 .
[0027] The back lever 55 is made into the shape of Y character which the back side opened by plane view, and front end section 55B has reached under the back end section 47B of the front lever 47. Therefore, the load sensor 52 can detect now the sum of the load of the both sides which act on back end section 47B of the front lever 47, and front end section 55B of the back lever 55.
[0028] As shown in drawing 6 (A) The distance L1 between the end points P2 of the center of rotation P1 of the front lever 47, and the seat cushion frames 20 and 22, the distance L2 between the contacting points P3 of the center of rotation P1 of the front lever 47, and the load sensor 52, the center of rotation P4 and the seat cushion frame 20 of the back lever 55, Between the distance L3 between the end points P5 of 22, and the distance L4 between the contacting points P6 of the center of rotation P4 of the back lever 55, and the front lever 47 L1>L3 or L2 -- < -- the rate of load redoubling according the rate of load redoubling there is relation of L4 and according to the highly sensitive setup 47, i.e., a front lever, to the load by the side of before the seat cushion frames 20 and 22 to the back lever 55 -- comparing -- the rate of predetermined -- it has set up greatly.
[0029] Moreover, as shown in drawing 5 , the stopper 58 for a movable range limit of the back lever 55 and the front lever 47 and the stopper 59 prepared in the lower part of the seat cushion 16 which counters the lower part of front end section 55B of the back lever 55, and near the back end section 47B of the front lever 47, and the rocking range of a **** cage, the back lever 55, and the front lever 47 is restricted to it, respectively. In addition, right-and-left both-ends 58A of a stopper 58 is being fixed the sheet slide upper rail 44 on either side or near the right-and-left both-ends 53A of a bracket 53, respectively.
[0030] Next, an operation of a **** 2 operation gestalt is explained. With the crew weight detection equipment of a **** 2 operation gestalt, if crew sits down on a sheet 12, the load which acts on the anterior part of a seat cushion 16 will act on the front lever 47 from the femoral region of the crew who sat down to the seat cushion 16. Moreover, the load which acts on the posterior part of a seat cushion 16 acts on the back lever 55 from the hip of the crew who sat down to the seat cushion 16. Consequently, the load of the both sides of back end section 47B of the front lever 47 and front end section 55A of the back lever 55 can act, and crew's weight can be presumed by measuring this load by the load sensor 52.
[0031] For this reason, when the crew 14 who sat down on the sheet 12 is in a slouchy posture (anteversion posture), while the load which escapes from crew's 14 guide-peg 14C on a floor 10 becomes large, the augend of the load concerning the anterior part of a seat cushion 16 becomes large compared with the decrement of the load concerning the posterior part of a seat cushion 16. For this reason, the load doubled by the front lever 47 becomes large, and the load which escaped from crew's guide peg on the floor can be amended.

[0032] Moreover, it becomes large to the load F5 which acts on the posterior part of the hip of the crew to whom the load F4 which acts on the anterior part of the femoral region of the crew who sat down to the seat cushion 16 through the front lever 47 also when the force F3 to the front joined crew in the time of braking, as shown in drawing 6 (B) to the seat cushion 16 sat down to the seat cushion 16 through the back lever 55 to the seat cushion 16. Consequently, since the rate of redoubling of the load which acts on the front lever 47 is set up more highly than the rate of redoubling of the load which acts on the back lever 55, a lost part of the detection weight by the load which escapes to a floor through crew's guide peg can be amended by the increment of the load which acts on the front lever 47.
[0033] Moreover, although the load F6 which escapes to a floor 10 through crew's guide peg becomes large also when a car goes down a slope In this case, while the force to the front by the inclination of a slope acts on the load which acts on the anterior part of a seat cushion 16 from the femoral region of the crew who sat down to the seat cushion 16 through the front lever 47 In order that the force to the front by the inclination of a slope may act also on the load which acts on the posterior part of a seat cushion 16 from the hip of the crew who sat down to the seat cushion 16 through the back lever 55, Also in this case, a lost part of the detection weight by the load which escapes to a floor through crew's guide peg can be amended like the time of braking by the force to the front which acts on the front lever 47 and the back lever 55.
[0034] When the crew who sat down on the sheet 12 does a backward-tilting posture, while the load which escapes from crew's guide peg on a floor becomes small on the other hand, the augend of the load concerning the posterior part of a seat cushion 16 becomes large compared with the decrement of the load concerning the anterior part of a seat cushion 16. For this reason, the load doubled by the front lever 47 also becomes small, and the small load which escaped from crew's guide peg on the floor can be amended. In addition, when a car accelerates and a car goes up a slope, a lost part of the detection weight by the small load which escapes to a floor through a guide peg by the force to the back which acts on the front lever 47 and the back lever 55 with acceleration can be amended similarly.
[0035] Therefore, with the crew weight detection equipment of a **** 2 operation gestalt, the error of crew's actual weight and crew's presumed weight measured by the load sensor 52 can be made small, and crew's weight can be presumed with a sufficient precision. Moreover, components cost can be reduced for the easy configuration which detects a load by one load sensor 52 using the front lever 47 and the back lever 55. Moreover, the load sensor 52 can be protected from a large load with the stopper 58 for a movable range limit, and a stopper 59.
[0036] In addition, although the stopper 58 was arranged under the front end section 55B of the back lever 55 and the stopper 59 has been arranged with the **** 2 operation gestalt in the lower part of the seat cushion 16 which counters near the back end section 47B of the front lever 47, the location of a stopper 58 and a stopper 59 is not limited to these locations.
[0037] Next, the 3rd operation gestalt of the crew weight detection equipment of this invention is explained according to drawing 7 - drawing 9 .
[0038] In addition, if attached to the same member as the 1st operation gestalt and the 2nd operation gestalt, the same sign is attached and the explanation is omitted.
[0039] As shown in drawing 8 , near the front end section of the sheet slide upper rail 44 on either side, the shaft 64 is supported to revolve pivotable through the front bracket 62. Lower limit section 66A of the front lever 66 is being fixed to the both ends of this shaft 64, respectively, and the front lever 66 and the shaft 64 are made pivotable to the direction of a counter clockwise of drawing 7 (the direction of arrow-head A of drawing 7), and the clock hand of cut (the direction of arrow-head B of drawing 7) of drawing 7 .
[0040] It is supported to revolve near the front end section of the seat cushion frames 20 and 22 of right and left of a sheet 12 pivotable with the shaft 68 by upper limit section 66B of the front lever 66 to the direction of a counter clockwise of drawing 7 (the direction of arrow-head C of drawing 7), and the clock hand of cut (the direction of arrow-head D of drawing 7) of drawing 7 .
[0041] Moreover, near the back end section of the sheet slide upper rail 44 on either side, the shaft 72 is supported to revolve pivotable through the back bracket 70. Lower limit section 74A of the back lever

74 is being fixed to the both ends of this shaft 72, respectively, and the back lever 74 and the shaft 72 are made pivotable to the direction of a counter clockwise of drawing 7 (the direction of arrow-head E of drawing 7), and the clock hand of cut (the direction of arrow-head F of drawing 7) of drawing 7 .
[0042]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the crew weight detection equipment which is applied to crew weight detection equipment, especially is arranged by the sheet of an automobile.

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PRIOR ART

[Description of the Prior Art] Conventionally, the structure shown in JP,7-186880,A is known as an example of the crew weight detection equipment arranged by the sheet of an automobile.
[0003] As shown in drawing 10 , with this equipment, the weight sensor 102 is arranged in seat cushion 100A of a sheet 100, and the inclination sensor 104 which detects the tilt angle of seat-back 100B is arranged in the connection section of seat cushion 100A and seat-back 100B. Although the detection value by the weight sensor 102 differs from the actual weight of the crew who sat down on the sheet 100, a control unit 106 detects the description which affects the difference of the detection value by the weight sensor 102, and actual crew's weight from the detecting signal from the inclination sensor 104, and it asks for crew's actual weight from the function based on this detected description, and the function of detection weight.

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EFFECT OF THE INVENTION

[Effect of the Invention] This invention according to claim 1 is a load detection means to detect each load applied before and after a sheet including the load concerning a seat back, An amendment means to amend each load before and after computing the load center of gravity of a sheet based on each load before and after detecting with a load detection means and detecting with a load detection means based on the calculation value, Since it has a crew weight presumption means to presume crew weight based on the amendment load amended with the amendment means, components cost can be reduced and it has the outstanding effectiveness that crew's weight can be presumed with a sufficient precision.
[0056] This invention according to claim 2 is a front lever rocked according to the load applied to the anterior part of a sheet including the load concerning a seat back, The back lever rocked according to the load applied to the posterior part of a sheet including the load concerning a seat back, A load detection means to detect the sum of the load doubled by the front lever by the predetermined rate of redoubling, and the load doubled by the back lever by the predetermined rate of redoubling, the rate of load redoubling according the rate of load redoubling by the preparation and the front lever to a back lever -- comparing -- the rate of predetermined -- since it set up greatly, components cost can be reduced and it has the outstanding effectiveness that crew's weight can be presumed with a sufficient precision.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, with this equipment, since the inclination sensor 104 other than the weight sensor 102 was needed in order to detect crew's actual weight, there was fault that components cost increased. In order to improve this, it is possible with the whole sheet, i.e., the both sides of a seat cushion and a seat back, to perform weight detection, but since the recess loads from crew's guide peg to a floor differ greatly depending on crew's taking-a-seat posture, even if the whole sheet performs weight detection, the precision of a detection load gets worse and the fault that dispersion in presumed weight becomes large as the result cannot be solved.
[0005] It is the purpose to obtain the crew weight detection equipment which this invention can reduce components cost in consideration of the above-mentioned fact, and can presume crew's weight with a sufficient precision.

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MEANS

[Means for Solving the Problem] A load detection means to detect each load applied before and after a sheet including the load which this invention according to claim 1 requires for a seat back, An amendment means to amend each load before and after computing the load center of gravity of a sheet based on each load before and after detecting with this load detection means and detecting with said load detection means based on the calculation value, It is characterized by having a crew weight presumption means to presume crew weight based on the amendment load amended with this amendment means.
[0007] Therefore, when crew sits down on a sheet, each load applied before and after a sheet including the load concerning a seat back is detected with a load detection means. Based on the amendment load which computed the load center of gravity of a sheet, amended each load of order with the amendment means based on that calculation value based on each load before and behind this, and was amended with the amendment means, crew weight is presumed with a crew weight presumption means. For this reason, the error of the presumed weight by change of a taking-a-seat posture can be made small, and crew's weight can be presumed with a sufficient precision.
[0008] The front lever rocked according to the load applied to the anterior part of a sheet including the load which this invention according to claim 2 requires for a seat back, The back lever rocked according to the load applied to the posterior part of a sheet including the load concerning a seat back, A load detection means to detect the sum of the load doubled by said front lever by the predetermined rate of redoubling, and the load doubled by said back lever by the predetermined rate of redoubling, the rate of load redoubling according the rate of load redoubling by the preparation and said front lever to said back lever -- comparing -- the rate of predetermined -- it is characterized by setting up greatly.
[0009] Therefore, although a large load escapes from crew's guide peg on a floor when the crew who sat down on the sheet does an anteversion posture, at this time, the augend of the load concerning the anterior part of a sheet becomes large compared with the decrement of the load concerning the posterior part of a sheet. For this reason, the rate of load redoubling of the front lever greatly set up compared with the rate of load redoubling by the back lever doubles at the big rate of redoubling, and the load concerning the anterior part of a sheet is transmitted to a load detection means with it. Consequently, the large load which escaped from crew's guide peg on the floor can be amended. When the crew who sat down on the sheet does a backward-tilting posture, while the load which escapes from crew's guide peg on a floor becomes small on the other hand, the decrement of the load concerning the anterior part of a sheet becomes small compared with the augend of the load concerning the posterior part of a sheet. For this reason, the load doubled by the front lever also becomes small and the small load which escaped from crew's guide peg on the floor can be amended.
[0010]
[Embodiment of the Invention] The 1st operation gestalt of the crew weight detection equipment of this invention is explained according to drawing 1 - drawing 3 .
[0011] In addition, the drawing Nakaya mark FR shows the direction of the car front, and an arrow head UP shows the direction of the car upper part. As shown in drawing 1 , the sheet 12 is attached in the floor 10 of a car, and the sheet 12 equips it with the seat cushion 16 with which crew 14 sits down, and

the seat back 18 supporting crew's 14 regions of back.
[0012] As shown in drawing 2 , between the floors 10 of a car near the front end section of the seat cushion frames 20 and 22 of right and left of a sheet 12, the front side load sensors 24 and 26 as a load detection means to detect a sheet load from the load (arrow head F1 of drawing 1) applied to the anterior part of a sheet 12 including the load applied to a seat back 18, respectively are arranged. Moreover, between the floors 10 of a car near the back end section of the seat cushion frames 20 and 22 of right and left of a sheet 12, the back side load sensors 28 and 30 as a load detection means to detect a sheet load from the load (arrow head F2 of drawing 1) applied to the posterior part of a sheet 12 including the load applied to a seat back 18, respectively are arranged.
[0013] As shown in drawing 1 , these front side load sensors 24 and 26 and the back side load sensors 28 and 30 It connects with the load presumption circuit 32 as the amendment means constituted including the microcomputer, and a crew weight presumption means. While this load presumption circuit 32 computes the load center of gravity of a sheet 12 based on each loads F1 and F2 before and after detecting by the load sensors 24, 26, 28, and 30 and amending each loads F1 and F2 based on that calculation value Crew weight is presumed based on the amended amendment load. Moreover, the acceleration sensor 34 which detects the acceleration which acts on the cross direction of a car is connected to the load presumption circuit 32, and even if based on the acceleration G detected by the acceleration sensor 34, it amends.
[0014] Next, an operation of a **** 1 operation gestalt is explained. With the crew weight detection equipment of a **** 1 operation gestalt, in case crew's 14 weight is presumed, acceleration G is read into the load presumption circuit 32 from an acceleration sensor 34. Moreover, while reading each load into the load presumption circuit 32 from the front side load sensors 24 and 26 and computing the before side load F1 as these averages, each load is read into the load presumption circuit 32 from the back side load sensors 28 and 30, and the backside load F2 is computed as these averages.
[0015] Next, while it computes load center-of-gravity location GX=F1/(F1+F2) of a cross direction from the side load F1 and the backside load F2 before computing the load presumption circuit 32 By change of this load center-of-gravity location GX and acceleration G, the before side load F1 and the backside load F2 are amended, sheet load F=A(F1+F2)+BGX+CG is computed, and presumed weight W1=[of crew] f (F) is computed from this sheet load F.
[0016] In addition, A, B, and C are constants, respectively and are memorized by the map of the load presumption circuit 32.
[0017] That is, when the before side load F1 and the backside load F2 are equal, it is set to load center-of-gravity location GX=1/2, and the center between the front side load sensors 24 and 26 and the back side load sensors 28 and 30 serves as a load center-of-gravity location. On the other hand, by crew's 14 anteversion posture etc., in being large compared with the backside load F2, in order that a load center-of-gravity location may move [the before side load F1] to front side load sensor 24 and 26 side, the load center-of-gravity location GX is set to GX>1/2. Consequently, in sheet load F=A(F1+F2) +BGX+CG, the large load which escapes from crew's 14 guide-peg 14A to a floor 10 can be amended, and presumed weight W1=[of crew] f (F) can be computed with a sufficient precision.
[0018] Moreover, by the reliance posture (backward-tilting posture) to crew's 14 seat back 18 etc., in being small compared with the backside load F2, in order that a load center-of-gravity location may move [the before side load F1] to back side load sensor 28 and 30 side, the load center-of-gravity location GX is set to GX<1/2. Consequently, in sheet load F=A(F1+F2)+BGX+CG, the small load which escapes from crew's 14 guide-peg 14A to a floor 10 can be amended, and presumed weight W1= [of crew] f (F) can be computed with a sufficient precision.
[0019] Moreover, when acceleration G has occurred to the front, the recess load from crew's 14 guide-peg 14A to a floor 10 becomes small, and when Deceleration G has occurred to the front, the recess load from crew's 14 guide-peg 14A to a floor 10 becomes large.
[0020] Therefore, as shown in drawing 3 , with the **** 1 operation gestalt, the amendment alpha 1 of the load center-of-gravity location accompanying posture change of crew 14 and amendment alpha 2 by change of acceleration G are carried out to the measured sheet loads F1 and F2. For this reason, the error

N of crew's actual weight W and the presumed weight W1 can be made small, and crew's weight can be presumed with a sufficient precision. Moreover, components cost can be reduced for the configuration which does not need an inclination sensor like the conventional technique.

[0021] Next, the 2nd operation gestalt of the crew weight detection equipment of this invention is explained according to drawing 4 - drawing 6 .

[0022] As shown in drawing 4 , the sheet 12 is attached in the floor 10 of a car, and the sheet 12 equips it with the seat cushion 16 with which crew sits down, and the seat back 18 supporting crew's regions of back.

[0023] The sheet slide rail 40 of a right-and-left pair is arranged along with the car cross direction at the sheet 12, and the sheet slide lower rail 42 order both ends of each sheet slide rail 40 are being fixed to the floor 10 by holddown members, such as a bolt, respectively. The sheet slide upper rail 44 is set to these sheet slide lower rails 42 possible [a slide] to the car cross direction, respectively, and the seat cushion frames 20 and 22 of a sheet 12 are connected with the sheet slide upper rail 44. Therefore, the sheet 18 is movable to the car cross direction in one with the sheet slide upper rail 44 to the sheet slide lower rail 42.

[0024] The shaft 46 is constructed over wall section 44A set up near the front end section of the sheet slide upper rail 44 on either side. Bearing 47A formed in before [the front lever 47] side right-and-left both ends is supported to revolve pivotable by this shaft 46, respectively, and the front lever 47 is pivotable to the center of rotation in a shaft 46 to the clock hand of cut (the direction of arrow-head A of drawing 5) of drawing 5 , and the direction of a counter clockwise of drawing 5 (the direction of arrow-head B of drawing 5). Moreover, the front end section of bearing 47A of the front lever 47 is supported to revolve pivotable with the shaft 48 by the wall sections 20A and 22A formed in the front end lower part of the seat cushion frames 20 and 22. Therefore, if the anterior part of the seat cushion frames 20 and 22 is pressed below from the femoral region of the crew who sat down to the seat cushion 16 by the load which acts on the anterior part of a seat cushion 16, the front lever 47 will rotate in the direction of a counter clockwise of drawing 5 (the direction of arrow-head B of drawing 5).

[0025] The front lever 47 is made into the shape of Y character which the front side opened by plane view, and back end section 47B has reached the abbreviation central lower part of a seat cushion 16. The load sensor 52 as a load detection means is arranged above back end section 47B of the front lever 47. This load sensor 52 is being fixed to the central subordinate side of a bracket 53, and right-and-left both-ends 53A of a bracket 53 is being fixed to the sheet slide upper rail 44 on either side, respectively.

[0026] On the other hand, the shaft 54 is constructed over wall section 44B set up near the back end section of the sheet slide upper rail 44. Bearing 55A formed in backside [the back lever 55] right-and-left both ends is supported to revolve pivotable by this shaft 54, respectively, and the back lever 55 is pivotable to the center of rotation in a shaft 54 to the clock hand of cut (the direction of arrow-head C of drawing 5) of drawing 5 , and the direction of a counter clockwise of drawing 5 (the direction of arrow-head D of drawing 5). Moreover, the back end section of bearing 55A of the back lever 55 is supported to revolve pivotable with the shaft 56 by the wall sections 20B and 22B formed in the back end lower part of the seat cushion frames 20 and 22. Therefore, if the posterior part of the seat cushion frames 20 and 22 is pressed below from the hip of the crew who sat down to the seat cushion 16 by the load which acts on the posterior part of a seat cushion 16, the back lever 55 will rotate to the clock hand of cut (the direction of arrow-head C of drawing 5) of drawing 5 .

[0027] The back lever 55 is made into the shape of Y character which the back side opened by plane view, and front end section 55B has reached under the back end section 47B of the front lever 47. Therefore, the load sensor 52 can detect now the sum of the load of the both sides which act on back end section 47B of the front lever 47, and front end section 55B of the back lever 55.

[0028] As shown in drawing 6 (A) The distance L1 between the end points P2 of the center of rotation P1 of the front lever 47, and the seat cushion frames 20 and 22, the distance L2 between the contacting points P3 of the center of rotation P1 of the front lever 47, and the load sensor 52, the center of rotation P4 and the seat cushion frame 20 of the back lever 55, Between the distance L3 between the end points P5 of 22, and the distance L4 between the contacting points P6 of the center of rotation P4 of the back

lever 55, and the front lever 47 L1>L3 or L2 -- < -- the rate of load redoubling according the rate of load redoubling there is relation of L4 and according to the highly sensitive setup 47, i.e., a front lever, to the load by the side of before the seat cushion frames 20 and 22 to the back lever 55 -- comparing -- the rate of predetermined -- it has set up greatly.

[0029] Moreover, as shown in drawing 5 , the stopper 58 for a movable range limit of the back lever 55 and the front lever 47 and the stopper 59 prepared in the lower part of the seat cushion 16 which counters the lower part of front end section 55B of the back lever 55, and near the back end section 47B of the front lever 47, and the rocking range of a **** cage, the back lever 55, and the front lever 47 is restricted to it, respectively. In addition, right-and-left both-ends 58A of a stopper 58 is being fixed the sheet slide upper rail 44 on either side or near the right-and-left both-ends 53A of a bracket 53, respectively.

[0030] Next, an operation of a **** 2 operation gestalt is explained. With the crew weight detection equipment of a **** 2 operation gestalt, if crew sits down on a sheet 12, the load which acts on the anterior part of a seat cushion 16 will act on the front lever 47 from the femoral region of the crew who sat down to the seat cushion 16. Moreover, the load which acts on the posterior part of a seat cushion 16 acts on the back lever 55 from the hip of the crew who sat down to the seat cushion 16. Consequently, the load of the both sides of back end section 47B of the front lever 47 and front end section 55A of the back lever 55 can act, and crew's weight can be presumed by measuring this load by the load sensor 52.

[0031] For this reason, when the crew 14 who sat down on the sheet 12 is in a slouchy posture (anteversion posture), while the load which escapes from crew's 14 guide-peg 14C on a floor 10 becomes large, the augend of the load concerning the anterior part of a seat cushion 16 becomes large compared with the decrement of the load concerning the posterior part of a seat cushion 16. For this reason, the load doubled by the front lever 47 becomes large, and the load which escaped from crew's guide peg on the floor can be amended.

[0032] Moreover, it becomes large to the load F5 which acts on the posterior part of the hip of the crew to whom the load F4 which acts on the anterior part of the femoral region of the crew who sat down to the seat cushion 16 through the front lever 47 also when the force F3 to the front joined crew in the time of braking, as shown in drawing 6 (B) to the seat cushion 16 sat down to the seat cushion 16 through the back lever 55 to the seat cushion 16. Consequently, since the rate of redoubling of the load which acts on the front lever 47 is set up more highly than the rate of redoubling of the load which acts on the back lever 55, a lost part of the detection weight by the load which escapes to a floor through crew's guide peg can be amended by the increment of the load which acts on the front lever 47.

[0033] Moreover, although the load F6 which escapes to a floor 10 through crew's guide peg becomes large also when a car goes down a slope In this case, while the force to the front by the inclination of a slope acts on the load which acts on the anterior part of a seat cushion 16 from the femoral region of the crew who sat down to the seat cushion 16 through the front lever 47 In order that the force to the front by the inclination of a slope may act also on the load which acts on the posterior part of a seat cushion 16 from the hip of the crew who sat down to the seat cushion 16 through the back lever 55, Also in this case, a lost part of the detection weight by the load which escapes to a floor through crew's guide peg can be amended like the time of braking by the force to the front which acts on the front lever 47 and the back lever 55.

[0034] When the crew who sat down on the sheet 12 does a backward-tilting posture, while the load which escapes from crew's guide peg on a floor becomes small on the other hand, the augend of the load concerning the posterior part of a seat cushion 16 becomes large compared with the decrement of the load concerning the anterior part of a seat cushion 16. For this reason, the load doubled by the front lever 47 also becomes small, and the small load which escaped from crew's guide peg on the floor can be amended. In addition, when a car accelerates and a car goes up a slope, a lost part of the detection weight by the small load which escapes to a floor through a guide peg by the force to the back which acts on the front lever 47 and the back lever 55 with acceleration can be amended similarly.

[0035] Therefore, with the crew weight detection equipment of a **** 2 operation gestalt, the error of crew's actual weight and crew's presumed weight measured by the load sensor 52 can be made small,

and crew's weight can be presumed with a sufficient precision. Moreover, components cost can be reduced for the easy configuration which detects a load by one load sensor 52 using the front lever 47 and the back lever 55. Moreover, the load sensor 52 can be protected from a large load with the stopper 58 for a movable range limit, and a stopper 59.

[0036] In addition, although the stopper 58 was arranged under the front end section 55B of the back lever 55 and the stopper 59 has been arranged with the **** 2 operation gestalt in the lower part of the seat cushion 16 which counters near the back end section 47B of the front lever 47, the location of a stopper 58 and a stopper 59 is not limited to these locations.

[0037] Next, the 3rd operation gestalt of the crew weight detection equipment of this invention is explained according to drawing 7 - drawing 9 .

[0038] In addition, if attached to the same member as the 1st operation gestalt and the 2nd operation gestalt, the same sign is attached and the explanation is omitted.

[0039] As shown in drawing 8 , near the front end section of the sheet slide upper rail 44 on either side, the shaft 64 is supported to revolve pivotable through the front bracket 62. Lower limit section 66A of the front lever 66 is being fixed to the both ends of this shaft 64, respectively, and the front lever 66 and the shaft 64 are made pivotable to the direction of a counter clockwise of drawing 7 (the direction of arrow-head A of drawing 7), and the clock hand of cut (the direction of arrow-head B of drawing 7) of drawing 7 .

[0040] It is supported to revolve near the front end section of the seat cushion frames 20 and 22 of right and left of a sheet 12 pivotable with the shaft 68 by upper limit section 66B of the front lever 66 to the direction of a counter clockwise of drawing 7 (the direction of arrow-head C of drawing 7), and the clock hand of cut (the direction of arrow-head D of drawing 7) of drawing 7 .

[0041] Moreover, near the back end section of the sheet slide upper rail 44 on either side, the shaft 72 is supported to revolve pivotable through the back bracket 70. Lower limit section 74A of the back lever 74 is being fixed to the both ends of this shaft 72, respectively, and the back lever 74 and the shaft 72 are made pivotable to the direction of a counter clockwise of drawing 7 (the direction of arrow-head E of drawing 7), and the clock hand of cut (the direction of arrow-head F of drawing 7) of drawing 7 .

[0042] It is supported to revolve near the back end section of the seat cushion frames 20 and 22 of right and left of a sheet 12 pivotable with the shaft 76 by upper limit section 74B of the back lever 74 to the direction of a counter clockwise of drawing 7 (the direction of arrow-head G of drawing 7), and the clock hand of cut (the direction of arrow-head H of drawing 7) of drawing 7 .

[0043] As shown in drawing 9 , to lower limit section 74A of the left-hand side back lever 74 If heights 74C is formed below and the load F9 to a lower part acts on the upper limit section 74 of the back lever 74 from the seat cushion frame 20 The back lever 74 rotates a shaft 72 to the center of rotation in the direction of a counter clockwise of drawing 9 (the direction of arrow-head E of drawing 9), and presses the load sensor 78 as a load detection means by which heights 74C was attached in the back bracket 70, back (the direction of arrow-head K of drawing 9). In addition, the load receptacle spring 80 is arranged in the periphery section of the load sensor 78, and the back lever 74 is energized to the clock hand of cut (the direction of arrow-head F of drawing 9) of drawing 9 .

[0044] As shown in drawing 8 , the shaft 64 and the shaft 72 are connected through the connecting rod 82. These connecting rod 82 order both ends 82A and 82B are supported to revolve by heights 64A formed in the shaft 64 and the shaft 72, and heights 72A pivotable, respectively, on the turning effort which acts on a shaft 64, a connecting rod 82 moves back (the direction of arrow-head J of drawing 7), and the turning effort which acts on a shaft 64 joins the turning effort of a shaft 72.

[0045] moreover, the die length of the back lever 74 -- comparing -- the die length of the front lever 66 -- predetermined die length -- the rate of redoubling of the load to which the rate of redoubling of the load which is set up for a long time and acts on the front lever 66 acts on the back lever 74 -- the rate of predetermined -- it is set up highly. Consequently, the load which acts on the front lever 66, and the load which acts on the back lever 74 are doubled from the predetermined rate of redoubling, respectively, and it acts on the load sensor 78.

[0046] In addition, as shown in drawing 9 , the stoppers 84 and 86 for a movable range limit are

arranged in the heights 74C order location by the back bracket 70, and the load sensor 78 is protected with the load receptacle spring 80 to it.
[0047] Next, an operation of a **** 3 operation gestalt is explained. With the crew weight detection equipment of a **** 3 operation gestalt, if crew 14 sits down to a seat cushion 16 as shown in drawing 7, the load which acts on the anterior part of a seat cushion 16 will act on the front lever 66 from femoral region 14A of the crew 14 who sat down to the seat cushion 16 [near the front end section of the seat cushion frames 20 and 22 on either side]. Moreover, the load which acts on the posterior part of a seat cushion 16 acts on the back lever 74 from hip 14B of the crew 14 who sat down to the seat cushion 16 [near the back end section of the seat cushion frames 20 and 22 on either side]. Consequently, while a load acts on lower limit section 66A of the front lever 66, and lower limit section 74A of the back lever 74, crew's 14 weight can be presumed because the load which acts on lower limit section 66A of the front lever 66 through a connecting rod 82 is transmitted to the back lever 74 and measures these loads by the load sensor 78.
[0048] Moreover, although the load which escapes to a floor through crew's 14 guide peg becomes large for example, when crew 14 is in an anteversion posture in this case, from femoral region 14A of the crew 14 who sat down to the seat cushion 16 [near the front end section of the seat cushion frames 20 and 22 on either side] The augend of a load F10 which acts on the anterior part of a seat cushion 16 from hip 14B of the crew 14 who sat down to the seat cushion 16 [near the back end section of the seat cushion frames 20 and 22 on either side] It becomes large to the decrement of a load F11 which acts on the posterior part of a seat cushion 16. Consequently, since the rate of redoubling of the load which acts on the front lever 66 is set up more highly than the rate of redoubling of the load which acts on the back lever 74, a lost part of the detection weight by the large load which escapes to a floor 10 through guide-peg 14C can be amended by the increment of the load which acts on the front lever 66.
[0049] Moreover, as well as the 2nd operation gestalt when a car goes down a slope, although the load which escapes to a **** floor becomes large, crew's 14 guide peg in this case, from femoral region 14A of the crew 14 who sat down to the seat cushion 16 [near the front end section of the seat cushion frames 20 and 22 on either side] While the force to the front by the inclination of a slope acts on the load which acts on the anterior part of a seat cushion 16 The force to the front by the inclination of a slope acts on the load which acts on the posterior part of a seat cushion 16 from hip 14B of the crew 14 who sat down to the seat cushion 16 [near the back end section of the seat cushion frames 20 and 22 on either side]. Consequently, a lost part of the detection weight by the large load which escapes to a floor 10 through guide-peg 14C can be amended by the force to the front which acts on the front lever 66 and the back lever 74.
[0050] In addition, when a car slows down at the time of braking, a lost part of the detection weight by the load which escapes to a floor through a guide peg by the force to the front which acts on the front lever 66 and the back lever 74 by deceleration can be compensated similarly.
[0051] When the crew 14 who sat down on the sheet 12 does a backward-tilting posture, while the load which escapes from crew's 14 guide-peg 10C on a floor 10 becomes small on the other hand, the decrement of the load concerning the anterior part of a seat cushion 16 becomes small compared with the augend of the load concerning the posterior part of a seat cushion 16. For this reason, the load doubled by the front lever 66 also becomes small, and the small load which escaped from crew's 14 guide-peg 14C on the floor 10 can be amended. In addition, when a car accelerates and a car goes up a slope, a lost part of the detection weight by the small load which escapes to a floor 10 through guide-peg 14C by the force to the back which acts on the front lever 66 and the back lever 74 according to the inclination of acceleration and a slope can be amended similarly.
[0052] Therefore, with the crew weight detection equipment of a **** 3 operation gestalt, the error of crew's actual weight and crew's 14 presumed weight measured by the load sensor 78 can be made small, and crew's weight can be presumed with a sufficient precision. Moreover, components cost can be reduced for the easy configuration which detects a load by one load sensor 78 using the front lever 66 and the back lever 74. Moreover, the load sensor 78 can be protected from a large load with the load receptacle spring 80 and the stoppers 84 and 86 for a movable range limit.

[0053] Moreover, with the crew weight detection equipment of a **** 3 operation gestalt, since the levers 66 and 74 of four front and rear, right and left be use, while support rigidity be high and there be few problems of the backlash by the lack of support rigidity, in addition to the load receptacle spring 80, vibration transmit from a car body to a sheet can be easily reduce by use a shake-free material and shake-free structure for the stoppers 84 and 86 for a movable range limit.
[0054] Although this invention was explained above about the specific operation gestalt at the detail, this invention is not limited to this operation gestalt, and it is clear for this contractor its for other various operation gestalten to be possible within the limits of this invention.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

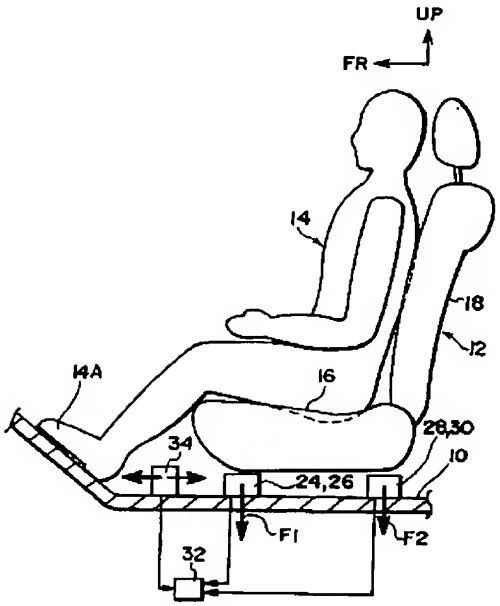
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the outline side elevation showing the important section of the crew weight detection equipment concerning the 1st operation gestalt of this invention.
[Drawing 2] It is the outline perspective view seen from the car slanting front which shows the important section of the crew weight detection equipment concerning the 1st operation gestalt of this invention.
[Drawing 3] It is the graph which shows the relation of the measurement sheet load of crew weight detection equipment and weight concerning the 1st operation gestalt of this invention.
[Drawing 4] It is the outline perspective view showing the important section of the crew weight detection equipment concerning the 2nd operation gestalt of this invention.
[Drawing 5] It is the outline side elevation showing the important section of the crew weight detection equipment concerning the 2nd operation gestalt of this invention.
[Drawing 6] (A) And (B) is the operation explanatory view of the crew weight detection equipment concerning the 2nd operation gestalt of this invention.
[Drawing 7] It is the outline side elevation showing the important section of the crew weight detection equipment concerning the 3rd operation gestalt of this invention.
[Drawing 8] It is the outline perspective view seen from the car slanting front which shows the important section of the crew weight detection equipment concerning the 3rd operation gestalt of this invention.
[Drawing 9] It is the expansion side elevation showing the lever section after the crew weight detection equipment concerning the 3rd operation gestalt of this invention.
[Drawing 10] It is the outline side elevation showing the important section of the crew weight detection equipment concerning the conventional operation gestalt.
[Description of Notations]
12 Sheet
16 Seat Cushion
18 Seat Back
20 Seat Cushion Frame
22 Seat Cushion Frame
24 Front Side Load Sensor (Load Detection Means)
26 Front Side Load Sensor (Load Detection Means)
28 Back Side Load Sensor (Load Detection Means)
30 Back Side Load Sensor (Load Detection Means)
32 Load Presumption Circuit (Amendment Means, Crew Weight Presumption Means)
34 Acceleration Sensor
40 Sheet Slide Rail
42 Sheet Slide Lower Rail
44 Sheet Slide Upper Rail

47 Front Lever
52 Load Sensor (Load Detection Means)
55 Back Lever
66 Front Lever
74 Back Lever
78 Load Sensor (Load Detection Means)
82 Connecting Rod

[Translation done.]

Drawing selection Representative drawing



12 シート
16 シートクッション
18 シートバック
32 荷重推定回路
（補正手段、乗員体重推定手段）
34 加速度センサ

[Translation done.]

* NOTICES *

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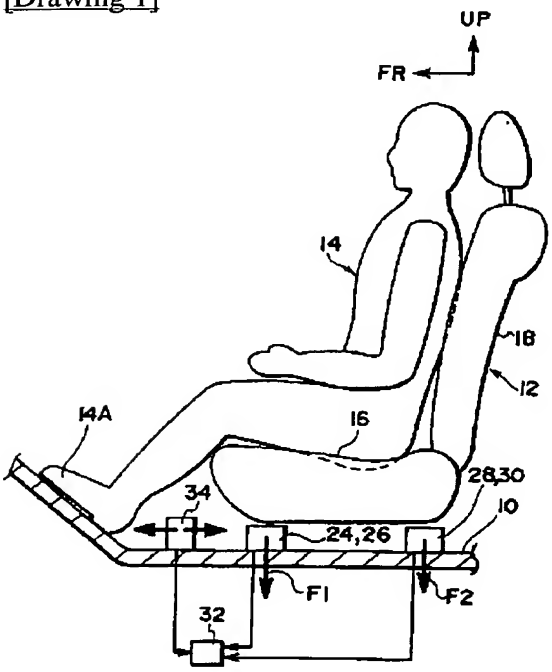
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

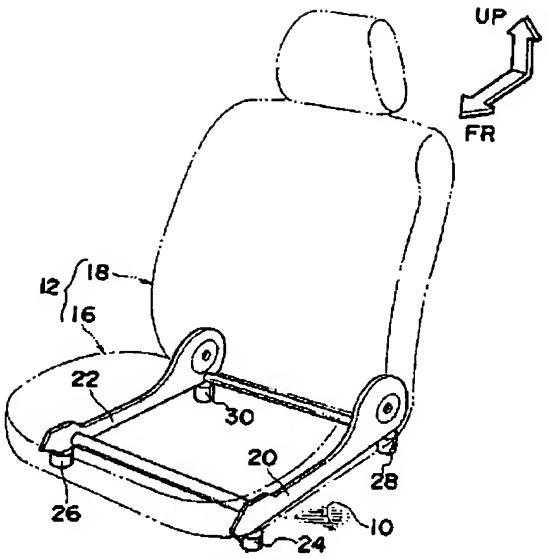
DRAWINGS

[Drawing 1]



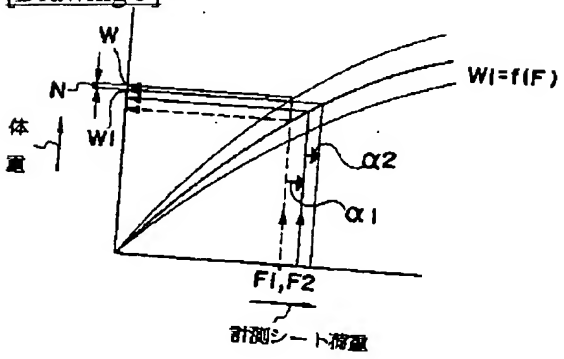
12	シート
16	シートクッション
18	シートバック
32	荷重推定回路 （補正手段、乗員体重推定手段）
34	加速度センサ

[Drawing 2]

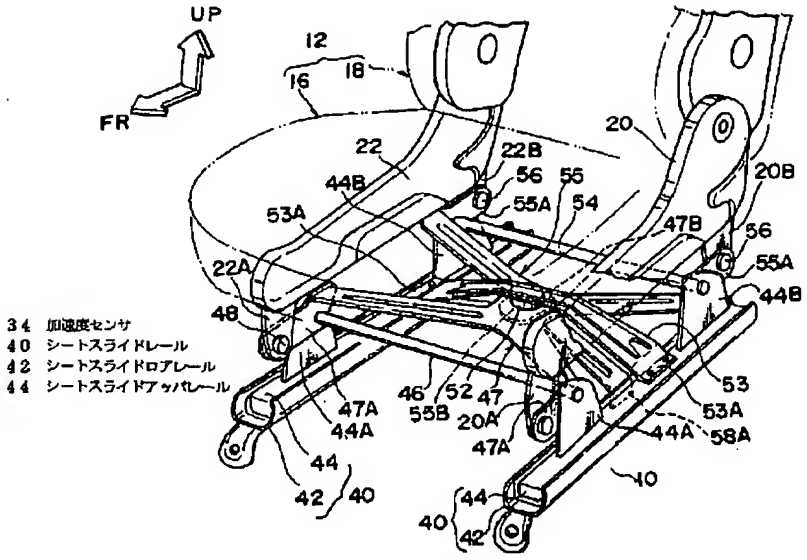


20 シートクッションフレーム
22 シートクッションフレーム
24 前方側荷重センサ（荷重検知手段）
26 前方側荷重センサ（荷重検知手段）
28 後方側荷重センサ（荷重検知手段）
30 後方側荷重センサ（荷重検知手段）

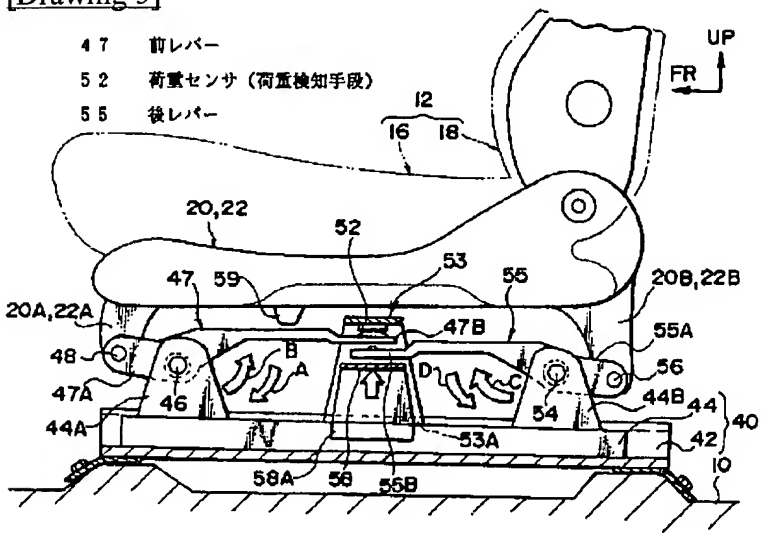
[Drawing 3]



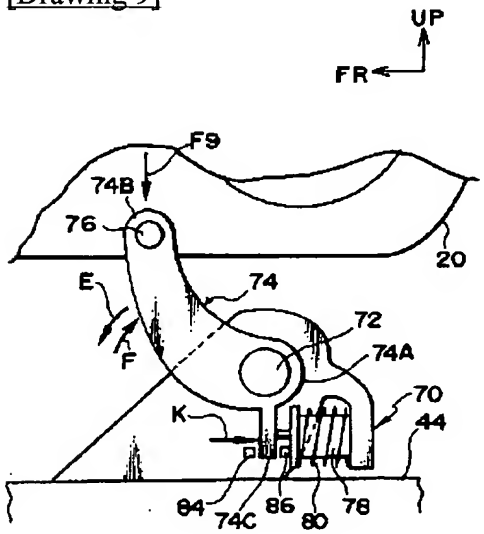
[Drawing 4]



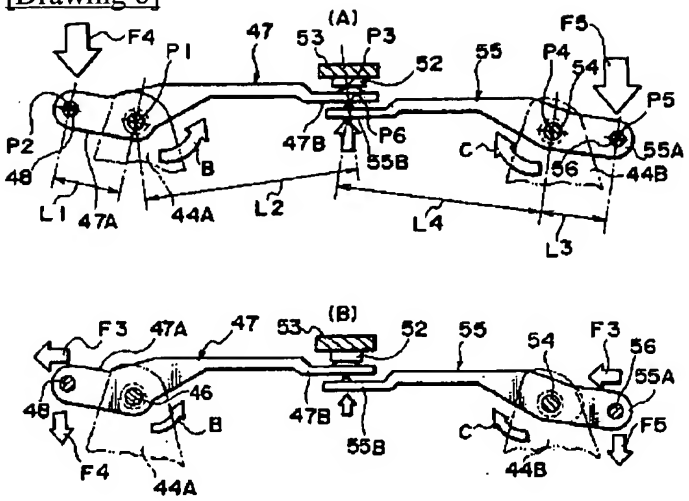
[Drawing 5]



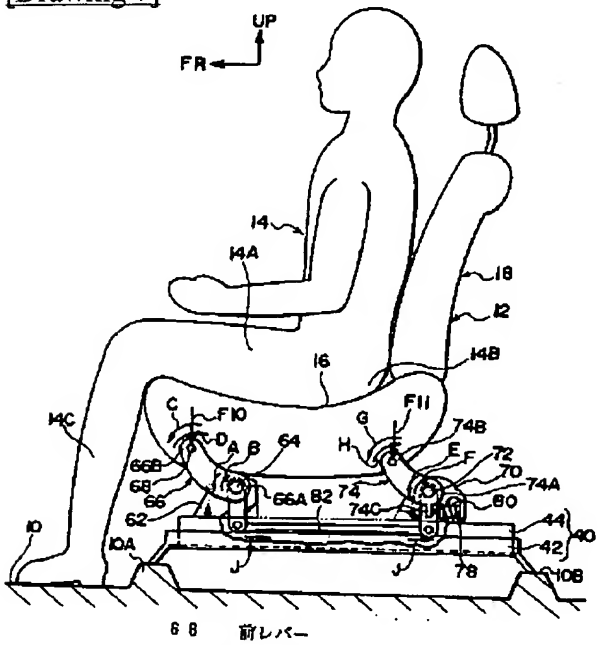
[Drawing 9]



[Drawing 6]

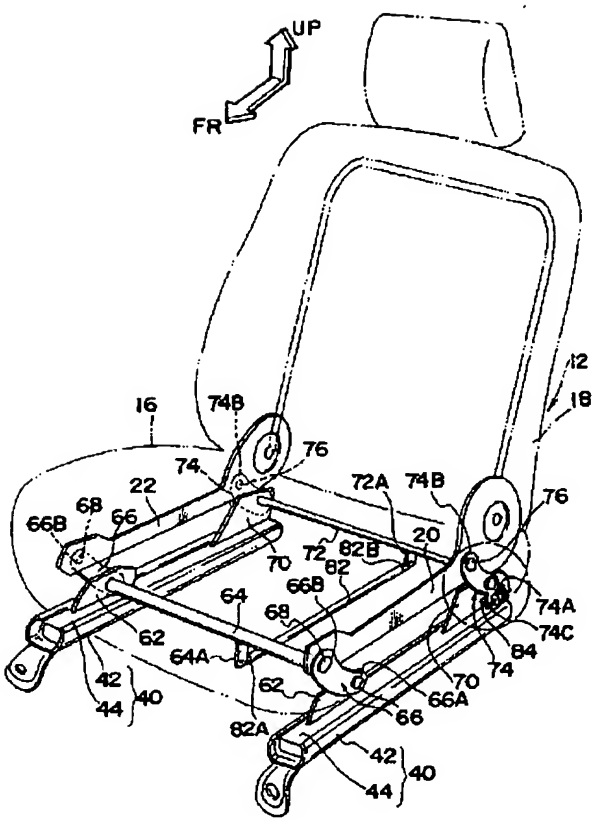


[Drawing 7]

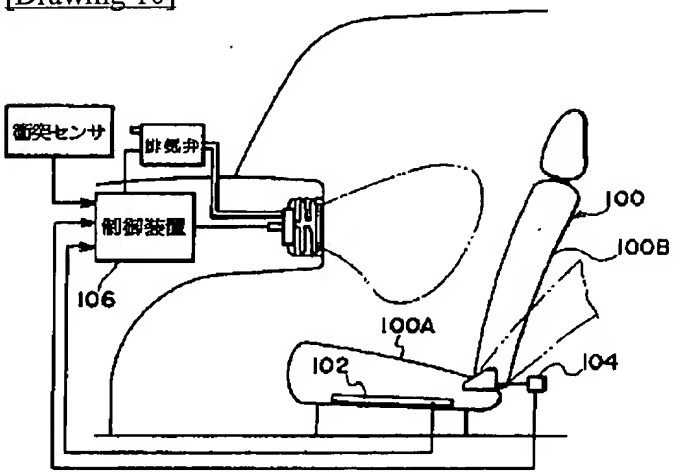


68 前レバー
74 後レバー
78 荷重センサ（荷重検知手段）
82 コネクティングロッド

[Drawing 8]



[Drawing 10]



[Translation done.]